gous foes with the long end of the lever. It must be a good, promising crop that will warrant the expense of fungicidal applications, and the larger the promise the greater the profit.

One other thought that follows upon this, and the end of this paper is reached. When a house or a community is afflicted with some contagious malady, pains are taken that the germs of the disease shall not remain lurking in out-of-the-way places, and assert themselves in the future. The carpets, and even wall-paper, are removed and the whole house fumigated or otherwise treated with some germ destroyer. While as thorough a cleansing as this is not possible in orchard, vineyard, or garden, there are some measures that could be taken with profit. If weeds are left to mature and scatter their seeds, weeds are expected to follow. In like manner, if all diseased leaves, stems, and fruit are allowed to pass the winter undestroyed, the chances are that the biblical injunction will not be overturned — concerning sowing and reaping. There is a legitimate and therefore profitable amount of soil-sanitation to be done, which comes under the head of cleaning up after crops. The burn-heap is to be a potent factor in future horticulture. If we continue to scatter the seeds of fungus decay, of that sowing we shall reap corruption.

It is a law of plant culture that the continuous growing of any one crop upon a given area of soil, tends to the concentration of the enemies of that crop — whether of insects or fungi. With annual crops, like most of those of the garden and grain field, the remedy is more easily applied, than in the case of fruits. There is a strong inclination to grow the crop for which the soil is naturally best fitted. Thus the onion grower desires to keep his best onion land continuously in onions, and the smut finally increases and ruins his crop and future prospects. Sweet potatoes can be grown to greatest profit only upon a special soil, in limited areas, and constant cropping has permitted the soil-rot to increase to such an extent that the crop is often a failure. The same is true of clover and other crops, but more particularly of those that are susceptible to some root disease. It therefore follows that in the serious consideration of our subject, the importance of a judicious management of crops should never be overlooked, and a system of rotation adopted that will bring the greatest health, other things remaining reasonable and satisfactory.

This continuous change of crops, united with full rations of available plant food, and proper sanitation, will do much to lighten the labors of the fungicidal applications, and render all such when found necessary of the greatest benefit.

Let the spraying of crops with compounds of copper, etc., come after the fair thing has been done for that crop under the head of farm or garden management. Here, as elsewhere, the ounce of prevention is worth a pound of cure, simply because it is prevention, and if we look at fungicides carefully, it will be found that they are preventions, after all.

Do not let me be misunderstood in this matter, for I am a full believer in the virtues of fungicides. There are many places where they pay and pay well, but they cannot do everything. They may ward off destructive diseases, as the copper salts for the black-rot of the grape, but they alone will by no means bring a profitable crop. Everything else needs to be done for the vines that will bring a full fruitage, and then it will pay to save the crop from premature decay. And finally, to carry my point one step further, when the plants have been surrounded by the best sanitary conditions, it is possible that the application of fungicides may be sometimes omitted. However, it will be a long time before all these points are settled, and in the mean time nothing is lost by turning them over in our minds.

ASTRONOMICAL NOTES.

A PLANET of the twelfth magnitude was discovered by Borrelly at Marseilles, France, Nov. 27. The position of the planet was in R.A. 4 h. 6 m. 6.7 s., $\delta + 33° 32' 58''$. The motion was -1 m. in R.A. and $-7'$ in declination.

The following ephemeris will assist those who desire to make a search for Winnecke's periodic comet, mention of which was made in a recent number of *Science*. The epoch of the ephemeris is for Berlin midnight.

1892	R.A. h.	m.	s.	Dec. °	′
Jan. 1	12	17	12	+13	2
2		18	15	13	4
3		19	17	13	7
4		20	18	13	9
5		21	20	13	12
6		22	20	13	15
7		23	20	13	18
8		24	20	13	21
9		25	19	13	25
10		26	17	13	29
11	12	27	15	+13	33

The following is a continuation of the ephemeris for Wolf's comet. The epoch is for Berlin midnight.

1891		R.A. h.	m.	s.	Dec. °	′
	Dec. 27	4	14	22	−14	37
	29		14	19	14	26
	31		14	33	14	16
1892	Jan. 2		14	33	14	5
	4		14	51	13	53
	6		15	15	13	39
	8		15	45	13	25
	10	4	16	22	−13	16

An interesting fact connected with the movement of this comet through the heavens, as seen from the earth, is that on the 6th of next February it will occupy almost the same position in the sky that it did on Nov. 12 last. This is also true of Nov 14 and Feb. 8; Nov 16 and Feb. 10. G. A. H.

NOTES AND NEWS.

THE *Pintor* or *Aguaje* is a singular phenomenon observed in the Bay of Callao during the summer months, from December to April. It consists of emanations of sulphuretted hydrogen gas, accompanied by changes in the color of the sea-water. The name "Painter" is given to it because it gives white paint a blackish tinge. Its occurrence is not confined to Callao, but is observed at various points along the coast from Payta (5° 5′ 30″ south latitude) to Pisco (13° 42′ 42″ south latitude), and at Pacasmayo (7° 24′ 30″ south latitude). The gas proceeds from the black mud which covers the bottom of the bay, and the reddish discoloration of the water is due to the presence of infusoria brought in from the open sea. It is not, however, definitely decided why the phenomenon occurs only in the summer and at certain points of the coast. According to Raimondi (*Bull of Amer. Geog. Soc.*, Vol. XXIII., No. 3), the waters of the Rimac are prevented from escaping from the Bay of Callao by the Humboldt current, which flows past the entrance, and, with the solid matter held in suspension, are exposed to the full force of a tropical sun. Where there is no river, or no current running along the coast, the "Painter" is not observed.

— A great deal of misapprehension is often found to exist in the popular mind in regard to matters of eating and drinking; the cause of this to some extent is to be traced to old time sayings, which have come down to us in the form of a concentrated infusion of somebody's opinion upon a subject of which he or she was wofully ignorant. One of these misapprehensions to which we may refer is as to the injuriousness of taking fluid with meals. One frequently hears it laid down as a maxim that "it is bad to drink with your meals, it dilutes the gastric juice." By way of explanation we may remark, says the *Medical Press*, that "it implies that the fluid taken is harmful." Whence this sagacious postulate originally came we cannot tell; it has quite the ring about it of an inconsequent deduction formed by a person whose presumption of knowledge was only exceeded by a lamentable ignorance of the subject. Medical men often find much difficulty in dealing with these museum specimens of antiquated science, for even educated persons are disposed to cling to the absurdities of their youth. Upon this matter Mr. Hutchison remarks in the last number of his *Archives*: "I observe with pleasure that the verdict of general experience and common sense has been confirmed by scientific experiment in the matter of taking fluid with meals. Dr. Tev. O. Stratievsky of St. Petersburg, after elaborate trials, has found that fluids materially assist the assimilation of proteids, and announces the following conclusion, which it is to be hoped no future experiments will controvert — on the whole, the widely-spread custom of taking fluids during or just before one's meals, proves to be rational and fully justified on strict scientific grounds. To take fluids with the meals is almost as important an adjunct to digestion as is the mastication of solid food preparatory to swallowing it. It is obvious, however, that there is a limit to the amount of fluid one can swallow with impunity — not to speak of comfort — just as much with meals as at other times." It would be dangerous to create a general impression that fluid is good with food irrespective of quantity. It is, moreover, a well-ascertained clinical fact that an excess of cumprandial fluid does retard digestion in certain people, and gives rise to discomfort in most. A little attention to one's sensations in such matters will far better fix the desirable limit than all the "data" in the world.

— A meeting of the honorary council of advice in connection with the Crystal Palace Electrical Exhibition, which is to be opened in London on Jan. 1 next, was held recently at the Mansion House. Mr. Gardner, the secretary of the Crystal Palace Company, read the report of the directors, in which they referred to the Electrical Exhibition at the Palace in 1881, and to the enormous strides which had since been made in the industry. The exhibition in 1881 was recognized as the pioneer of electrical engineering in England, and it was confidently believed that the exhibition of 1892 would be remembered in history "as showing that the infant Electra has grown to years of maturity, and is capable of further aiding science, commerce, and the world at large." The space available had been over-applied for, and every section of the industry would be well represented. Invitations would be issued to public bodies throughout the United Kingdom to visit the exhibition, where the various systems of electric lighting would be on view, and in this direction alone very great saving of expense to the authorities would be effected, and other advantages must, the directors believed, also accrue. On the motion of Mr. W. H. Preece, the following gentlemen were appointed to act as a committee of experts in connection with the exhibits: Professors W. Grylls Adams, W. E. Ayrton, W. Crookes, D. E. Hughes, A. B. W. Kennedy, J. Perry, and Silvanus Thompson, Major P. Cardew, Sir J. N. Douglass, Mr. W. B. Esson, Mr. Gisbert Kapp, and Mr. Preece.

— The temperature of the rivers of central Europe has been recently investigated by Herr Forster of the Society of Geographers at Vienna University, says *Nature*; the monthly and annual means being obtained from thirty-one stations. He distinguishes (with reference to river and air temperature) the following types: (*a*) Glacier rivers. These are always warmer than the air in winter, and much cooler in summer; on the average of the year they are about 1° colder. (*b*) Glacier rivers modified by lakes, and rivers from lakes in general. These are, except in the spring, warmer than the air, therefore warmer on the general average. (*c*) Mountain rivers. Like glacier rivers, these are warmer in winter and cooler in summer than the air, but the difference, especially in summer, is not nearly so great; so that, on the average of the year, it is approximately 0°. (*d*) Flat country rivers. Their temperature is, throughout the year, higher than that of the air; and the annual average difference is over 1°. Sometimes a different relation between river and air temperature is found in the upper part of a river and in the lower, and transition-types occur between those above indicated.

— A new system of wood-paving that is now being tried in Paris makes use of pieces of oak about four inches long, split up similarly to ordinary kindling-wood. The sticks are laid loosely on end in fine sand on a bed of gravel from four to four and one-half inches thick. A layer of fine sand is spread over them, and they are alternately watered and beaten several times. In about forty-eight hours the water has completely penetrated the wood causing it to swell into a compact mass, which is capable of supporting the heaviest traffic, according to reports.

— Elderly persons tell surprising stories of the old-time fear of giving cold water to fever patients. This has long since passed, and they now are permitted to drink freely. Still further than this, starting principally from the theoretical consideration that the poisonous products of the action of disease-producing bacteria in the infectious diseases may be got rid of by washing them out, a few physicians have tried the administration of drinks in very great quantities, — much more than the patients would voluntarily call for. For instance, Dr. Valentini of Königsberg (Deutsche Med. Woch., xvii, 914) directs the nurses to give the typhoid-fever patients milk, bouillon, and water in quantities that would appear impracticable if mentioned. In addition to it all he has latterly given 200 grams of sugar of milk dissolved in a litre of water as a food and to increase the diuretic effect. The results, we are told, are surprising. The concentrated renal secretion is diluted and increased and, even at the acme of the disease, its quantity is maintained at much above what is usual in fever. In milder cases the diuresis is kept somewhat above the normal. The patients were more comfortable than before the beginning of the treatment, and all the cases terminated favorably.

— Dr. Ermling contributes to a recent number of *Globus* an interesting paper on the Nurhagi of Sardinia. There are said to be more than 3,000 of these prehistoric buildings in the island. They are almost all in fertile districts, and are built in groups which are separated from one another by wide and generally barren spaces. According to many archæologists, the Nurhagi were tombs; but the late Canon Spano, in his "Memoria sopra i Nurhagi di Sardegna," published in 1854, contended that they were dwellings and places of refuge, and this view is accepted by Dr. Ermling. In a trench closed with asphalt, under the ruins of a Nurhage near Teti, various bronze statuettes, swords, spear-heads, and axes were discovered lately by shepherds. These treasures, according to *Nature*, are now in the museum of M. Gouin, a Frenchman, in Cagliari. Some of the objects have been analyzed, and it has been found that the chemical composition of the bronze statuettes is not the same as that of the axes. The statuettes consist of copper 90 3, tin 7.4, iron 2.1; the axes, of copper 87.4, tin 12.0, lead 0.5, with traces of iron.

— Mr. James Shaw writes to *Nature* as follows: "I labor under the peculiar inconvenience of having a right eye of normal power and a short-sighted left eye. The numerals on the face of a clock five-eighths of an inch high are visible to the right eye at twelve feet distant; but in order to discern them as clearly with my left eye I require to bring that organ of vision as near to the figures as eight inches. On looking at my gold chain hanging on my breast in daylight and with both eyes, the chain colored yellow and towards the left, is perceived by the right eye, while a steely blue chain, another, yet the same, is perceived about an inch to the right and a little higher up. By artificial light the same phenomenon presents itself, but the difference of color is not so apparent; the yellow to the right is only dimmer. Again, when a page of *Nature* is being read with the short-sighted eye, there ap-

pears, about an inch to the left, part of the same column, small, and the black, under artificial light, like weak purple. The right-hand side of this ghost-like column is lost to the right eye, being commingled with the larger, darker letters seen by the short-sighted left, which cover it like the more recent writing on a palimpsest. Middle life was reached before the discovery was made. These experiences must be gone through with intent, for objects generally being perceived altogether with the right eye, all that the left seems good for is to supply a little more light. The perception of the difference of color is as good with the one eye as the other, and the short-sighted eye can read smaller type. As the inferior animals, so far as I know, have no habit of peeping or looking with one eye shut and the other open, it occurred to me that this ability might be a limited one. I tried the experiment with school children, and to my surprise found that a few were quite unable to keep one eye shut and the other open at the same time, and a few did it with an effort, making in all about a fourth of the number. Adults were likewise under similar limits, but to a less extent. This may be the reason why the discovery of inequality of vision, as Sir John Herschel remarks, is often made late in life. Indeed, he mentions an elderly person who made the unpleasant discovery that he was altogether blind of an eye."

— The University Extension Conference in Toronto, on Nov. 5–6, led to the establishment of the Canadian Society for the Extension of University Teaching, the organization of which is largely modelled on that of the American Society. The Universities of Ontario and Quebec were thoroughly represented and the leading colleges, normal schools, and high schools of the Dominion sent delegates. President James of the American Society gave the leading address on the evening of Nov. 5, and was present at the different sessions to explain the various questions that arose. The presidents of the new society are Sir Donald A. Smith of Montreal, Chancellor G. W. Allen of Trinity, Chancellor Edward Lake of Toronto University, Professor Goldwin Smith, Chancellor Sanford Fleming of Queen's, and Abbé Laflamme of Laval University. The secretary is Mr. William Houston of Toronto, the well-known economist, to whom is due in large measure the success of the meeting and the establishment of the society.

— The following is an abstract of a bulletin on "The Hessian Fly," recently published by Professor F. M. Webster, consulting entomologist to the Ohio experiment station. This fly is a small, dark-colored, two-winged fly, about one-eighth of an inch long and shaped much like the wheat midge, both belonging to the same order and family of insects. The male is more slender than the female, which, when full of eggs, slightly resembles a diminutive mosquito moderately full of blood. The life of the insect in the adult stage is short, the male dying soon after pairing and the female soon after oviposition. The egg is about one-fiftieth of an inch long, of a dull reddish color. The larva or maggot is, when first hatched, of a nearly white color, with a tinge of red, but later they are very light green, clouded with white. The pupa is formed under cover of the puparium, which last is known as the "flaxseed" stage, on account of its resemblance to a flaxseed in form and color. The insect is best known under this name and in this stage of development. The eggs are deposited by the female very soon after she hatches from the "flaxseed," as the rule, on the upper side of the leaf. This task is finished in a few days, after which she dies. The young hatching from the egg works its way downward, beneath the sheath to its base. In the fall this is just above the roots below ground, but in spring they do not go below ground, as a rule, but stop at or near one of the lower joints. It is proper to say that this pest suffers much from the attacks of several minute parasites, which attack and destroy it in both the egg and larval or maggot stage. There are two annual attacks of the Hessian fly, one appearing in the fall and the other in the spring. With the fall brood the time of depositing the eggs varies with the latitude, the farther north the locality the earlier the time of egg laying. In northern Ohio the eggs are deposited early in September, while in the southern part this is delayed until probably early in October, the grain over the territory between these points being stocked with eggs between the dates given. Whether there is the same variation with respect to the spring brood is not known. The eggs at this season are deposited in April and May, the insect usually reaching the "flaxseed" stage before harvest and remaining through July and August in the stubble. The preventive measures may be noticed as follows: Sowing at the proper time; burning of the stubble; rotation of crops; sowing long, narrow plats in late summer as baits; applying quick-acting fertilizers to seriously infested fields in the fall in order to encourage attacked plants to throw up fresh tillers, and to increase the vigor of these that they may make sufficient growth to withstand the winter. After the fly has gained possession of a field Professor Webster knows of no application that can be made which will destroy it. Doubtless pasturing the field, if early sown, will often result in reducing the numbers of the pest, besides giving to the ground that compact, pulverized nature which it should have had at first. No doubt many larvæ and "flaxseeds" by this means would be crushed, but very few would enter into the food of the animals grazing thoreon, unless the plants were pulled up both stem and roots. Sheep are probably the best animals to turn on wheat as they are not heavy enough to injure plants by trampling.

— The work of university extension has been undertaken in Australia by the University of Melbourne. There are at present nineteen lecturers on the list whose courses include a wide range of subjects in the departments of history, literature, art, philosophy, and science. It is claimed that while the work will suffer under certain disadvantages as compared with England, the rural population being scantier and less compact, and the means of communication not so good, the average Victorian has greater means and more leisure at his disposal than the average Englishman. Certainly the Australians are not a people lacking either in energy or in quickness to avail themselves of whatever advantages may come within their reach. It is interesting to note another illustration of the analogy between Australian and American development in the adoption of the short course of six lectures. With the success of the work, however, the tendency to longer courses will certainly appear in Australia as it has already done in the United States.

— On Dec. 2, Mr. G. H. Robertson read before the London Society of Arts a paper on "Secondary," or, as he prefers to call them, "Reversible Batteries," which is reported in *Engineering*. After giving the history of their invention and improvement, he reviewed the chemical changes which take place in the acid, this being a subject to which he has devoted very great attention. Planté considered that the variations in electromotive force were due to the formation of peroxides in the acid. Messrs. Gladstone and Tribe, testing the acid between the plates, always found traces of something which decolorized permanganate, and might therefore be hydrogen dioxide or ozone. In 1878 Berthelot discovered persulphuric acid ($H_2S_2O_8$), and showed it was the primary product of the electrolysis of sulphuric acid solution, and that the hydrogen dioxide present in sulphuric acid after electrolysis is due to the action of that body on the acid. Persulphuric acid begins to decompose as soon as the current is stopped, and its decomposition is accompanied by the formation of hydrogen dioxide, unless the acid is too dilute. Mr. Robertson found that when cells were tested they contained active oxygen, due to the presence of persulphuric acid and peroxide of hydrogen in varying proportions. During charge persulphuric acid is the main constituent; during discharge the quantity of hydrogen dioxide gradually increases; while in a cell that has been at rest some time there is very little except hydrogen dioxide to be found. Active oxygen forms at once on the passage of the current, decreases slightly, and then increases to a little above its first value. Starting either charge or discharge always causes initial increase, except in the case of cells which have been long idle, when there is a diminution due to the decomposition of the excess of hydrogen dioxide in the acid. Persulphuric acid does not itself reduce peroxide of lead, but it forms hydrogen dioxide on standing, and this is capable either of oxidizing the lead plate to litharge, or of reducing the peroxide plate to the same substance. In each case the litharge is converted into sulphate by the sulphuric acid. This

appears to explain the well-known deleterious effect of rest on a cell. In an ordinary good cell of 45 pints capacity there is sufficient active oxygen to convert 3.25 to 7.5 grammes of peroxide of lead into sulphate, or to undo the work of one or two ampère-hours charge. At each reversal, however, the peroxides are broken up, but if the cells stand idle the plates get sulphated, and the amount of active oxygen formed in the next passage of the current shows a marked increase. In sodium sulphate cells the active oxygen is usually less than in plain cells and the hydrogen dioxide always so. The variations in electromotive force appear to depend on which plate hydrogen dioxide is formed at. When present at the peroxide plate it causes a rise, but when diffused through the acid and present at the lead plate it causes a lowering.

— At the Methodist Chinese Mission, 205 West 14th Street, New York, a writer in *Our Language* for December states that he witnessed on Nov. 8 a demonstration of the value of phonetic spelling as a stepping stone in teaching pupils to read ordinary English. A pupil of the school, who had received five lessons a week for three weeks, was examined and found able to read seventy-four pages of "Harper's First Reader." He had been taught by Mr. Knoflach, using "Sound-English" at first, and passing from this into the ordinary print. The Chinaman's mission teacher stated that her pupil could neither read nor speak English, except three or four short phrases, when Mr. Knoflach took him in hand, and she, together with several of the other teachers, expressed much wonder and delight at the achievement. The man also read the first eight chapters of Genesis. The teaching is especially difficult in such a case as this, for the pupil cannot understand the instructor's explanations; besides, several sounds in English are strange to Chinese vocal organs. Mr. Knoflach has since begun to teach German and Italian children to read English by the same means, in a New York charity school.

— Nossilof, who has devoted so much time to the exploration of Nova Zembla, spent last winter at the western entrance of Mathew Strait, in a house specially constructed after his own plans and brought from Archangel. Up to November M. Nossilof was able to make excursions into the Kara Sea, collecting birds and animals, surveying the coast, and taking soundings in the sea. The winter was unusually stormy, and the sea remained open until spring. Torrents of rain fell, so that the country was covered with a coating of ice, and the reindeer perished from hunger; hundreds of seals were frozen on the ice, and fish were thrown up in heaps on the shore. Changes of temperature occurred with great suddenness: from —31° F. the thermometer rose to +37° F. in a few hours. The spring and summer were correspondingly severe, and the temperature did not rise above 41° F. up to the end of July. Nevertheless, the scientific work of the expedition was carried on without interruption, and large zoological collections were made (*Scottish Geographical Magazine*, December). This is the third winter M. Nossilof has spent in Nova Zembla. His next journey will be to the peninsula of Yalmal.

— The *Abhandlungen* of the Royal Prussian Meteorological Institute (Bd i., No. 4, 1891) contain the first part of a treatise on the climate of Berlin, referring to rainfall and thunderstorms. Berlin possesses a long series of observations, commencing with the beginning of the eighteenth century, but in this investigation some of the earlier observations have not been used. The subjects treated, as we learn from *Nature*, are: (1) The amount of rainfall, the annual mean being given as 23 inches. The extreme values varied from 14.26 inches in 1887 to 30 inches in 1882. The wettest months were June and July, yielding together 24 per cent of the annual amount. (2) Rain frequency. The average number of days on which 0.08 of an inch fell was 152. The months of greatest rainfall frequency were November and December. (3) Hail and soft hail (*Graupel*). The former occurred on 2 to 3 days and the latter on 3 to 4 days in each year, and mostly in the months of May, June, and July. (4) Snow. A Berlin winter numbers on an average 33 snowy days. The distribution according to months is very curious: snow does not occur most frequently in the coldest months; it falls as often in March as in December. It lies on the ground 49 days on an average. (5) Intensity of rainfall. Daily falls of more than 2 inches are quite exceptional, and of 1½ inches are not frequent. The greatest fall was 1.86 inches in 1½ hours. (6) Wet and dry periods. Attention is more particularly given to periods of short duration; wet periods of five or more days are fewer than dry periods of similar length; the former average 7 5 and the latter 13.2 per year. (7) Thunderstorms. Berlin enjoys comparative immunity from thunderstorms, as they occur on an average only 15 days in the year, about half of them being in June and July. This valuable discussion has been carried out by Professor G. Hellmann.

— The external part of the laboratory which is being built in the Paris Museum of Natural History for Professor Chauveau, from the designs provided by him, is now finished. This laboratory will be used only for original research in physiology and bacteriology, and when completed will be the finest laboratory in France. But the Museum, according to *Nature*, is deeply in debt, and this may cause some delay.

— At the late International Congress of Hygiene and Demography, in Section 4, which was concerned with the Hygiene of Infancy and School-life, a resolution was passed in favor of the teaching of upright penmanship or vertical writing, on the ground that spinal curvature and short sight are caused by the faulty position of the youthful student, which is necessitated by slope of the letters. We can all of us remember, says *Lancet*, the trouble of learning to write, and the mental and physical toil which the making of our first pothooks and hangers involved. The number of muscles put in action when a person is writing is prodigious, and it is probable that in beginners every muscle of the body must yield its assent before the graphic symbols trickle from the pen. The fingers, wrist, elbow, and shoulder must all be held steady. The spine must be rigid and fixed below as well as above. The pelvis must be firm, and to this end the child often gets a support by its feet from the legs of the chair. The thorax is more or less rigid, and its movements are determined more by the work of the hand than the respiratory needs. Lastly, the knit brows and protruding tongue are unconscious muscular acts which serve to mark the effort, both of body and mind, which the child undergoes when learning to write. It is notorious that in writing our individuality asserts itself in spite of the pedagogue. We are taught certain rules for sitting at the desk and holding the pen, which we ultimately learn to neglect, and finally write in a fashion of our own. The great drawback of writing as an exercise for children is the fact that it involves one-half of the body only, and the necessity of fixing the spinal column causes the child instinctively to loll pon its left side while the right arm is working. To what extent the asymmetry of posture is caused by the fashion of sloping the letters it would be difficult to say, but there can be no doubt that the writing master ought to carefully watch the attitude of the child and endeavor to make it sit square to the desk and maintain the spinal column vertical. Every child should have a footstool to give firm support to the feet, and the seat should not be slippery, so that the fixation of the pelvis may be easy. Vertical writing is very legible, and if it diminishes to any extent the tendency to sit "lop-sided," it ought to be encouraged. The true remedy for the evils produced by learning to write seems to us to be to teach the child to use both hands, and to practise alternately with either hand. Vertical writing lends itself more readily to ambi-dexterity than does sloping writing, and there can be no doubt that a clerk who could write with equal facility with either hand, and could rest one side of the body while the other was working, would be little liable to writer's cramp and similar troubles. Seeing how enormous is the muscular effort involved in giving the hand sufficient steadiness, and that the brain fag is scarcely less than the muscle fag, it goes without saying that writing lessons should at first be of very short duration. Ten minutes with each hand ought to amply suffice.

— Mr. P. H. Rolfs, recently connected with the Iowa Agricultural College, Ames, Ia., has been appointed botanist and entomologist of the Florida Agricultural Experiment Station at Lake City, Fla.